Reprinted from 2000 *Columbia Basin Agricultural Research Annual Report. Spec. Rpt. 1012,* pp. 55-71, 2000
Oregon State University in cooperation with USDA-Agricultural Research Service, Pendleton, OR

STATEWIDE CEREAL VARIETY TESTING PROGRAM

Scott W. McDonald, Russell S. Karow,
Ernie Marx, Lisa Patterson, and Richard Smiley

Introduction

The statewide cereal variety trials were started in 1992 to provide information to producers on which varieties best suit the differing environments found throughout Oregon. Of the 10 trials located throughout the state, 5 are conducted in the Columbia Basin. Of these five, two are irrigated (Hermiston, La Grande) and three are rain fed (Moro, Lexington, Pendleton). Russ Karow, Extension cereals specialist, and Ernie Marx, research assistant, both with the Department of Crop and Soil Science, Oregon State University, coordinate the statewide program. Scott W. McDonald, research assistant, is the trial coordinator for the Columbia Basin sites. Site trials are planted, managed, and harvested by the trial coordinators with cooperation from growers. Trial locations, coordinators, and grower-cooperators are found in Table 1.

The harvested grain is processed, data are analyzed, and summary data are provided to Extension agents, seed dealers, agricultural field representatives, and growers around the state and throughout the region. The Lexington site replaced the Heppner site in 1999 in Morrow County. Data from the Heppner site has been combined with the data from the Lexington site and is referred to as Morrow County in the data tables.

Yield data reported in this article is for the Columbia Basin only. More complete data, including test weights and protein, are located on the internet (www.css.orst.edu/cereals/) and in various publications (Karow and Marx, 2000), (Karow et al., 2000).

The program for statewide variety testing is grower-driven. If you have ideas about varieties to be included in your area or have suggestions for program improvements, please contact Scott W. McDonald, cereal grains coordinator (541-278-4353), or Russ Karow , OSU Extension cereals specialist (541-737-5857).

Materials and Methods

Dryland plots (5 ft × 20 ft) at Lexington, Pendleton, and Moro were seeded at 20 seeds/ft^2. Irrigated plots (5 ft × 20 ft) at La Grande and Hermiston were seeded at 30 seeds/ft^2. Seeding rates for dryland plots ranged from 68 to 134 lb/acre, depending on the variety, to attain the desired rate of 20 seeds/ft^2. Irrigated seeding rates ranged from 98 to 201 lb/acre. All trials were arranged in a randomized complete block design with three replications. Plots were seeded using small plot drills. Seeding, harvest, and production practices were typical for each location. Winter grain trials at Lexington were abandoned in 1999 due to poor soil moisture at planting and freezing temperatures during December 1998.

Harvested grain was cleaned with a Pelz rub-bar cleaner. Plot yield, test weight, protein, and moisture were determined on cleaned grain samples. Yields are reported on a 10 percent moisture and 60 lb per

bushel basis for wheat and triticale and in pounds per acre for barley. Protein is reported on a 12 percent moisture basis and was determined using a Tecator Infratec 1225 whole grain analyzer.

Results and Discussion

Yield information from the 1999 trials and compiled data from 1997-1999 are included in Tables 2 through 9. Comparisons between varieties need to be made over a number of years before any conclusions can be drawn as to how they will perform at a particular location. New lines may do well in the first year in the trials, but they must be evaluated for at least 3 years to determine general yield levels and adaptation.

Soft White Common Winter wheat *(Tables 2 and 3)*

Weatherford became available in fall 1999. This new release continues to yield well when compared with other productive varieties such and Madsen or Rod. Heading date is similar to Madsen but matures later than Stephens. Grain quality is similar to current varieties, and winter hardiness is comparable to Stephens. Weatherford is moderately disease-resistant to eyespot, foot rot, powdery mildew, common bunt, leaf rust, and stripe rust. Ivory is a hard white winter that is currently under reselection and purification in Oregon. It is being released for specific market uses and is scheduled for release in fall 2000.

Club Winter wheat *(Tables 2 and 3)*

High yielding club wheats have been released in the past couple of years. Coda, Temple, and Hiller have shown that they yield well in many areas and have resistance to stripe rust and foot rot. Edwin and Bruehl are two club wheats that were released last year by WSU. Edwin is a Moro replacement with good emergence and yield potential. Bruehl was released primarily for areas that have severe snowmold problems. It also has good yield potential in areas of medium to high rainfall. Both varieties have good milling properties. More information will be available in future years as these varieties are incorporated into the Oregon variety trials.

Winter barley *(Tables 4 and 5)*

Winter barleys recommended for the Columbia Basin are Strider and Kold. Both are resistant to barley stripe rust. Foundation seed for Strider was made available in fall 1999. Registered and certified seed is available for Kold. Scio has above average yields at many sites, but tends to have lower test weights. Another drawback is that Scio is also susceptible to scald and barley stripe rust.

Spring wheat *(Table 6 and 7)*

Rainfed sites had lower yields in 1999 than in past years, likely due to low or no rainfall during the growing season. The Lexington (Morrow County) site was not included in the tables, because there were no significant yield differences between varieties.

The hard white spring variety IDO377S yielded well in 1999 with 3-year averages being better than most soft white varieties. Pro-Mar holds the license to production and must be contacted by interested growers at 1-888-840-3777

Winsome, a new release form Oregon State University, is a hard white spring. Yield is similar to slightly lower than IDO377S, and heading date is later than IDO377S. Winsome has shown to be of superior quality for Asian noodle

production. Foundation seed was released in the spring of 2000.

Hard red spring wheats Jefferson (IDO462) and Scarlet (WA7802) are recent releases which have performed well at dryland sites over a 3-year period. Jefferson is slightly taller and more likely to lodge than WPB936. Idaho breeders intended Jefferson for dryland sites. It has performed well at Pendleton and Moro. Jefferson also has yielded well at the irrigated Hermiston site. Protein levels are comparable to existing hard red varieties. Foundation seed is available for Jefferson. Scarlet yields somewhat less than Jefferson and seems to be best suited for dryland areas. Scarlet maintains good protein levels across all Columbia Basin sites.

Spring barley *(Tables 8 and 9).*

Barley stripe rust (BSR) resistance has become a primary focus of breeding programs in the Pacific Northwest. Many BSR resistant lines have been developed and have been in the statewide trials for 2 years (1997 and 1998). Orca and Montana's Chinook are among the more promising BSR resistant spring varieties. Valier is a spring barley developed by the Montana Agricultural Experiment Station to combine agronomic performance with improved cattle feeding characteristics. Tango, a BSR resistant line intended as a replacement for Steptoe, has been submitted for release by OSU.

Conclusion

Grain yields need to be considered over a number of years for any given variety. Factors such as hardiness and disease resistance need to be considered in addition to yield. While many varieties may excel in a given location in a given year, differences between widely grown varieties are often negligible when data from multiple years is examined. Before switching to a new variety, small acreage should be grown for comparison to old varieties, preferably for more than 1 year, before making large shifts in acreage.

Acknowledgements

We thank John Cuthbert, Norm Goetze, Carl Haugerud, and Chris Rauch for their donations of land, time, and effort to the statewide variety testing program. Without their contribution of resources, this program would not be possible. Cash funding for the statewide variety testing program is provided by the OSU Agricultural Experiment Station, Oregon Wheat Commission, and Oregon Grains Commission. The OSU Extension Service provided the project coordinator's salary and the clerical support funding. Without the support of these organizations, this program would not be feasible.

References

Karow, R., and E. Marx. 2000. Winter cereal varieties for 2000. Special Report 775R. Oregon State Univ. Ext. Serv., Corvallis, OR.

Karow, R., E. Marx, S. McDonald, M. Bohle, G. Chilcote, R. Dovel, E. Eldredge, S. James, G. Reed, C. Shock and D. Smiley. 2000. Spring grain varieties for 2000. Special Report 986. Oregon State Univ. Ext. Serv., Corvallis, OR.

Table 1. Oregon statewide cereal variety testing program, trial locations, site coordinators, and grower-cooperators, 1999.

Trial name	Trial type	Trial location	Trial coordinator	Grower cooperator
Corvallis	all grains—dryland	Hyslop Farm	Russ Karow, Ernie Marx	
Morrow Co. (Lexington)	all grains—dryland	Starvation Farms	Scott McDonald	Chris Rauch
Hermiston	all grains—irrigated	Hermiston Exp. Stn.	Scott McDonald	
Klamath Falls	all grains—irrigated	Klamath Exp. Stn.	Randy Dovel, Greg Chilcote	
La Grande	all grains—irrigated	Cuthbert Farm	Scott McDonald	John Cuthbert
Madras	all grains—irrigated	Central OR Exp. Stn.	Steve James, Mylen Bohle	
Moro	all grains—dryland	Sherman Exp. Stn.	Scott McDonald	
North Valley (Cornelius)	winter grains—dryland	Goetze Farm	Russ Karow, Ernie Marx	Norm Goetze
North Valley (Scio)	spring grains—dryland	Haugerud Farm	Russ Karow, Ernie Marx	Carl Haugerud
Ontario	all grains—irrigated	Malheur Exp. Stn.	Eric Eldredge, Clint Shock	
Pendleton	all grains—dryland	Pendleton Exp. Stn.	Scott McDonald	

Table 2. 1999 winter wheat yield data across four Columbia Basin locations.+

Variety or line*	Market class**	Hermiston	La Grande***	Moro	Pendleton	4-site Average	4-site % of Average‡
		Yield (bu/acre)					
Boundary	HR	73	47	62	87	67	105
Coda	Club	80	67	69	96	78	122
Connie	Durum	46	–	13	39	–	–
Edwin	SW	61	28	50	63	50	79
Foote	SW	25	28	52	74	45	70
Gene	SW	73	24	50	75	55	87
Hiller	Club	70	38	64	91	66	103
Hybritech 1021	SW	52	47	59	85	61	95
ID10085-5	SW	56	51	56	84	62	97
ID86-10420A	SW	55	53	62	107	69	108
Ivory	HW	55	46	54	82	59	93
MacVicar	SW	76	44	64	88	68	106
Madsen	SW	70	63	66	96	74	115
Madsen+Stephens	SW	79	53	59	80	68	106
OR3971244	SW	73	55	49	69	61	96
OR908387	SW	44	37	56	89	56	88
OR939515	SW	78	60	66	88	73	114
OR939526	SW	84	64	65	92	76	119
OR939528	SW	65	37	61	87	62	98
OR943575	HW	84	38	59	75	64	100
Quantum 7817	SW	41	50	52	91	59	92
Rely	Club	75	26	61	87	62	98
Rod	SW	96	61	64	92	78	122
Rohde	Club	64	41	66	78	62	97
Stephens	SW	72	47	63	85	67	105
Stephens - (high seed rate)	SW	68	53	69	83	68	107
Stephens - (low seed rate)	SW	72	43	64	85	66	103
Stephens - no Gaucho	SW	73	46	63	82	66	104
Temple	Club	61	33	64	92	63	98
Weatherford	SW	92	58	60	85	74	115
Average		**67**	**46**	**59**	**83**	**64**	–
PLSD (5%)		**13**	**14**	**10**	**12**	**11**	–
PLSD (10%)		**11**	**12**	**8**	**10**	**9**	–
CV		**12**	**19**	**10**	**7**	**9**	–
P-value		**0**	**0**	**0**	**0**	**0**	–

* All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted. Seeding rate was 20 seeds per square foot for low rainfall dryland sites and 30 seeds per square foot for irrigated and high rainfall sites, unless otherwise noted. The seeding rate was reduced by 10 seeds per square foot for the Stephens low seed rate entry and increased by 10 seeds per square foot for the Stephens high seed rate entry.

** SW=soft white, HW=hard white, HR=hard red

*** La Grande trials were damaged by hail storms on June 24, 1999.

‡ Percent of average is the average yield of each variety as a percentage of the average yield of all varieties (in this case, 64 bu/acre).

\+ Lexington was not included because the trial was abandoned due to poor stand establishment.

Table 3. 1997-99 winter wheat yield data across six locations in Oregon.

Variety or line*	Market class**	Hermiston	La Grande	Moro	Morrow County	Ontario	Pendleton	All sites Average
1997		---------- Yield (bu/acre; 10% moisture)----------						
Boundary	HR	—	—	—	—	111	—	—
Coda	Club	93	136	81	74	107	94	97
Foote	SW	79	114	62	41	90	65	75
Gene	SW	96	103	81	49	124	61	86
Hiller	Club	103	135	93	60	124	79	99
ID86-10420A	SW	75	—	65	46	109	73	74
MacVicar	SW	94	135	70	58	100	40	83
Madsen	SW	88	128	78	61	117	76	91
Madsen+Stephens	SW	86	116	82	58	104	70	86
Quantum 7817	SW	91	121	63	53	104	74	84
Rely	Club	95	127	81	58	111	79	92
Rod	SW	97	125	81	58	117	76	92
Rohde	Club	85	124	83	57	124	73	91
Stephens	SW	80	137	78	54	127	63	90
Stephens - no Gaucho	SW	86	126	71	58	106	62	85
Temple	Club	90	135	83	61	106	90	94
Weatherford	SW	91	134	79	64	107	67	90
Average yield		**89**	**126**	**79**	**57**	**110**	**70**	**88**
1998								
Boundary	HR	100	80	67	64	67	74	75
Coda	Club	95	86	71	60	98	83	82
Foote	SW	80	58	50	47	42	97	62
Gene	SW	117	82	66	55	67	89	79
Hiller	Club	106	81	75	61	76	93	82
ID86-10420A	SW	95	85	63	50	75	96	77
MacVicar	SW	99	93	73	54	60	80	76
Madsen	SW	102	90	76	81	76	106	88
Madsen+Stephens	SW	101	95	86	65	75	103	87
Quantum 7817	SW	103	82	62	61	67	100	79
Rely	Club	95	76	70	54	84	91	78
Rod	SW	117	78	67	55	102	80	83
Rohde	Club	104	70	66	65	85	85	79
Stephens	SW	113	83	82	65	73	97	85
Stephens - no Gaucho	SW	105	95	83	56	63	92	82
Temple	Club	95	85	71	68	84	92	83
Weatherford	SW	92	77	80	73	73	107	83
Average yield		**100**	**83**	**71**	**60**	**73**	**91**	**80**

Table 3. 1997-99 winter wheat yield data across six locations in Oregon (continued).

Variety or line*	Market class**	Hermiston***	La Grande***	Moro	Morrow County	Ontario	Pendleton	All sites Average
1999				Yield (bu/acre; 10% moisture)				
Boundary	HR	73	47	62	—	114	87	77
Coda	Club	80	67	69	—	107	96	84
Foote	SW	25	28	52	—	102	74	56
Gene	SW	73	24	50	—	70	75	58
Hiller	Club	70	38	64	—	129	91	78
ID86-10420A	SW	55	53	62	—	108	107	77
MacVicar	SW	76	44	64	—	126	88	79
Madsen	SW	70	63	66	—	120	96	83
Madsen+Stephens	SW	79	53	59	—	127	80	80
Quantum 7817	SW	41	50	52	—	101	91	67
Rely	Club	75	26	61	—	117	87	73
Rod	SW	96	61	64	—	112	92	85
Rohde	Club	64	41	66	—	103	78	70
Stephens	SW	72	47	63	—	126	85	79
Stephens - no Gaucho	SW	73	46	63	—	111	82	75
Temple	Club	61	33	64	—	107	92	71
Weatherford	SW	92	58	60	—	112	85	81
Average yield		**68**	**45**	**58**	**—**	**111**	**83**	**73**
1997-1999								
Boundary	HR	—	—	—	—	98	—	
Coda	Club	89	96	74	—	104	91	91
Foote	SW	61	66	55	—	78	78	68
Gene	SW	95	70	65	—	87	75	78
Hiller	Club	93	85	77	—	110	87	90
ID86-10420A	SW	75	—	63	—	97	92	82
MacVicar	SW	90	90	69	—	95	70	83
Madsen	SW	86	93	73	—	104	92	90
Madsen+Stephens	SW	89	88	76	—	102	84	88
Quantum 7817	SW	78	84	59	—	90	88	80
Rely	Club	89	76	71	—	104	86	85
Rod	SW	103	88	71	—	110	83	91
Rohde	Club	84	78	72	—	104	79	83
Stephens	SW	88	89	74	—	109	82	88
Stephens - no Gaucho	SW	88	89	72	—	93	79	84
Temple	Club	82	84	73	—	99	91	86
Weatherford	SW	92	90	73	—	97	86	88
Average yield 1997-1999		**86**	**85**	**69**	**—**	**98**	**81**	**84**

Table 3. 1997-99 winter wheat yield data across six locations in Oregon (continued).

Variety or line*	Market class**	Hermiston***	La Grande***	Moro	Morrow Co.	Ontario	Pendleton
1997-1999 percent of site average		----------Yield (bu/acre; 10% moisture)----------					
Boundary	HR	—	—	—	—	100	—
Coda	Club	104	114	106	—	106	112
Foote	SW	72	78	79	—	80	97
Gene	SW	111	82	94	—	89	92
Hiller	Club	109	100	112	—	112	108
ID86-10420A	SW	88	—	91	—	99	113
MacVicar	SW	105	107	99	—	97	86
Madsen	SW	101	110	105	—	107	114
Madsen+Stephens	SW	104	104	110	—	104	104
Quantum 7817	SW	92	99	85	—	92	109
Rely	Club	104	90	102	—	106	105
Rod	SW	121	104	102	—	113	102
Rohde	Club	99	93	103	—	106	97
Stephens	SW	103	105	107	—	111	101
Stephens - no Gaucho	SW	103	105	104	—	95	97
Temple	Club	96	100	105	—	101	112
Weatherford	SW	107	106	105	—	99	106

* All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted. Seeding rate was 20 seeds per square foot for low rainfall dryland sites and 30 seeds per square foot for irrigated, unless otherwise noted. The seeding rate was reduced by 10 seeds per square foot for the Stephens low seed rate entry and increased by 10 seeds per square foot for the Stephens high seed rate entry.

** SW=soft white, HW=hard white, HR=hard red

***Hermiston and La Grande trials were damaged by hail storms on June 24, 1999.

Table 4. 1999 winter barley yield data across five locations in Oregon.

Variety or line*	Market Class+	Corvallis	Hermiston**	Moro	Ontario	Pendelton	5-site** average	5-site** % of average
		----------Yield (lb/acre; 10% moisture)----------						
Kold	6RF	7,563						
OR1957369	6RF	7,036	4,220	2,346	3,409	4,672	4,895	99
ORW10	6RF/M	7,713	3,004	3,077	2,376	6,044	5,017	101
ORW11	6RF/M	7,743	1,699	2,476	2,333	4,448	4,668	94
Scio	6RF	7,287	1,367	2,752	3,990	5,307	5,239	106
Strider	6RF	7,710	3,940	3,430	4,437	5,628	5,638	114
Kold—untreated	6RF	7,893	3,793	2,687	2,015	5,564	4,306	87
Orca***	2RF	3,845	–	–	–	–	–	–
			–	–	–	–	–	–
Average		**7,099**	**3,004**	**2,795**	**3,093**	**5,277**	**4,960**	–
PLSD (5%)		**738**	**952**	**630**	**NS**	**782**	**NS**	–
PLSD (10%)		**606**	**774**	**512**	**1,497**	**636**	**NS**	–
CV		**6**	**17**	**12**	**33**	**8**	**15**	–
P-value		**0.00**	**0.00**	**0.03**	**0.07**	**0.01**	**0.15**	–

* All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted. Seeding rate was 20 seeds per square foot for low rainfall dryland sites and 30 seeds per square foot for irrigated.

** Hermiston trial was damaged by hail storms on June 24, 1999 and is not included in 5-site averages.

*** Orca is a spring barley grown as a winter barley in the Willamette Valley trials.

\+ 2RM=2 row malt, 2RF=2 row feed, 6RF=6 row feed, F/M= line being considered as a malt type

Table 5. 1997-99 barley yield data across five locations in Oregon.

Variety+	Market class**	Hermiston	La Grande*	Moro	Morrow Co.*	Pendleton	All sites average
1997		----------Yield (lb/acre; 10% moisture)----------					
Kold	6RF	4,052	7,564	3,683	4,271	4,067	4,728
ORW10	6RF	3,204	5,894	3,328	4,345	3,895	4,133
ORW11	6RF	4,165	8,675	3,619	5,147	4,330	5,187
Scio	6RF	4,980	8,980	4,232	4,507	3,860	5,312
Strider	6RF/M	5,424	8,470	4,659	5,003	3,717	5,454
Average yield		**4,518**	**7,138**	**3,942**	**3,961**	**3,802**	**4,672**
1998							
Kold	6RF	4,754	4,841	5,904	5,807	5,972	5,456
ORW10	6RF/M	3,221	4,775	4,201	5,296	4,570	4,413
ORW11	6RF/M	5,500	4,672	5,721	6,137	5,909	5,588
Scio	6RF	5,402	4,199	5,444	5,893	5,241	5,236
Strider	6RF/M	4,654	5,906	5,793	5,565	5,866	5,557
Average yield		**4,714**	**4,890**	**5,127**	**5,682**	**5,120**	**5,107**
1999							
Kold	6RF	4,220	—	2,346	—	4,672	3,746
ORW10	6RF/M	1,699	—	2,476	—	4,448	2,874
ORW11	6RF/M	1,367	—	2,752	—	5,307	3,142
Scio	6RF	3,940	—	3,430	—	5,628	4,333
Strider	6RF	3,793	—	2,687	—	5,564	4,015
Average yield		**3,004**	**—**	**2,795**	**—**	**5,277**	**3,692**
1997-1999							
Kold	6RF	4,342	—	3,978	—	4,904	4,408
ORW10	6RF	2,708	—	3,335	—	4,304	3,449
ORW11	6RF	3,677	—	4,031	—	5,182	4,297
Scio	6RF	4,774	—	4,369	—	4,910	4,684
Strider	6RF/M	4,624	—	4,379	—	5,049	4,684
Average yield 1997-1999		**4,079**	**—**	**3,955**	**—**	**4,733**	**4,255**
1997-1999 percent of trial average							
Kold	6RF	106	—	101	—	104	101
ORW10	6RF	66	—	84	—	91	87
ORW11	6RF	90	—	102	—	109	98
Scio	6RF	117	—	110	—	104	107
Strider	6RF/M	113	—	111	—	107	101

* In La Grande and Morrow counties, barleys were killed by a hard freeze in December of 1998.

\+ All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted. Seeding rate was 20 seeds per square foot for low rainfall dryland sites and 30 seeds per square foot for irrigated.

Table 6. 1999 spring wheat yields across five locations in Oregon.

Variety or line*	Market class**	Hermiston***	La Grande***	Moro	Morrow County	Pendleton	Average	5-site % of average
				Yield (bu/acre; 10% moisture)				
Alpowa (Adage)	SW	72	35	50	20	36	42	95
Alpowa (Gaucho)	SW	74	41	44	18	34	42	97
Alpowa (no Gaucho)	SW	76	34	49	16	36	42	94
IDO377S	HW	87	58	45	19	36	49	111
IDO506	SW	89	64	42	19	30	49	112
IDO523	HW	71	49	46	17	40	45	102
IDO525	SW	73	39	44	18	35	41	94
IDO526	SW	77	59	47	19	35	47	107
IDO533	HW	85	61	47	—	36	—	—
Jefferson	HR	84	44	45	20	36	46	104
M94-4393	Triticale	—	—	—	—	33	—	—
ML455	HW	83	37	50	17	32	43	97
OR4920307	HW	67	39	40	15	37	39	89
OR942845	SW	68	45	40	—	34	—	—
OR942889	SW	72	30	48	17	35	40	90
Penawawa	SW	80	48	50	17	36	46	104
Penawawa (high seed rate)	SW	75	46	43	21	35	45	102
Penawawa (low seed rate)	SW	84	39	48	17	36	44	100
Pomerelle	SW	90	57	41	20	36	50	113
Scarlet	HR	65	31	43	20	37	39	89
Treasure	SW	93	63	44	22	33	52	117
WA7850	SW	88	63	40	21	35	50	114
Wawawai	SW	77	26	39	21	35	39	90
Whitebird	SW	80	48	40	19	35	45	103
Winsome	HW	74	49	41	17	35	44	100
WPB BZ 692-108	SW	88	40	48	20	40	47	108
WPB BZ 992-322	HR	71	51	46	18	34	44	99
WPB936	HR	60	34	45	19	32	38	86
Yecora Rojo	HR	45	27	40	17	37	34	78
Average		**77**	**45**	**44**	**19**	**35**	**44**	**—**
PLSD (5%)		**12**	**11**	**NS**	**3**	**NS**	**NS**	**—**
PLSD (10%)		**10**	**9**	**7**	**3**	**NS**	**6**	**—**
CV		**10**	**15**	**11**	**10**	**10**	**10.6**	**—**
P-value		**0**	**0**	**0.1**	**0.01**	**0.38**	**0.06**	**—**

* All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted.
** SW=soft white, HW=hard white, HR=hard red
*** Hermiston and La Grande trials were damaged by hail storms on June 24, 1999.

Table 7. 1997-99 spring wheat yields across four locations in Oregon.

Variety or line*	Market class**	Hermiston	La Grande	Moro	Pendleton	4-site average
1997		----------Yield (bu/acre; 10% moisture)----------				
Alpowa (Gaucho)	SW	60	113	96	54	81
Alpowa (no Gaucho)	SW	55	102	87	47	73
IDO377S	HW	50	106	86	62	76
Jefferson (IDO462)	HR	55	86	77	48	67
Penawawa	SW	49	86	79	63	69
Pomerelle	SW	54	102	80	58	74
Scarlet (WA7802)	HR	50	90	68	49	64
Wawawai	SW	47	94	72	49	65
Whitebird	SW	37	82	80	45	61
Winsome (OR4870453)	HW	57	94	76	49	69
WPB936	HR	45	98	88	45	69
Yecora Rojo	HR	42	86	54	31	53
Average yield		**47**	**95**	**75**	**49**	**67**
1998						
Alpowa (Gaucho)	SW	36	67	54	47	51
Alpowa (no Gaucho)	SW	36	60	51	39	47
IDO377S	HW	42	49	50	44	46
Jefferson (IDO462)	HR	41	58	57	60	54
Penawawa	SW	46	54	53	43	49
Pomerelle	SW	46	44	46	44	45
Scarlet (WA7802)	HR	38	63	50	54	51
Wawawai	SW	42	50	51	49	48
Whitebird	SW	41	48	43	41	43
Winsome (OR4870453)	HW	45	52	47	42	46
WPB936	HR	24	55	45	54	44
Yecora Rojo	HR	21	70	41	53	46
Average yield		**39**	**55**	**49**	**48**	**48**

Table 7. 1997-99 spring wheat yields across four locations in Oregon (continued).

Variety or line*	Market class**	Hermiston	La Grande	Moro	Pendleton	4-site average
1999		----------Yield (bu/acre; 10% moisture)----------				
Alpowa (Gaucho)	SW	74	41	44	34	48
Alpowa (no Gaucho)	SW	76	34	49	36	49
IDO377S	HW	87	58	45	36	57
Jefferson	HR	84	44	45	36	52
Penawawa	SW	80	48	43	36	52
Pomerelle	SW	90	57	41	36	56
Scarlet	HR	65	31	43	37	44
Wawawai	SW	77	26	39	35	44
Whitebird	SW	80	48	40	35	51
Winsome	HW	74	49	41	35	50
WPB936	HR	60	34	48	32	44
Yecora Rojo	HR	45	27	40	37	37
Average yield		**77**	**45**	**43**	**35**	**50**
1997-1999						
Alpowa (Gaucho)	SW	57	74	65	45	60
Alpowa (no Gaucho)	SW	56	65	61	41	56
IDO377S	HW	60	71	60	47	59
Jefferson	HR	60	63	60	48	58
Penawawa	SW	59	63	60	48	57
Pomerelle	SW	64	67	57	46	58
Scarlet	HR	51	61	54	46	53
Wawawai	SW	55	56	54	44	52
Whitebird	SW	52	59	56	40	52
Winsome	HW	58	65	56	42	55
WPB936	HR	43	62	59	44	52
Yecora Rojo	HR	36	61	47	40	46
Average yield		**54**	**65**	**56**	**44**	**55**

Table 7. 1997-99 spring wheat yields across four locations in Oregon (continued).

Variety or line*	Market class**	Hermiston	La Grande	Moro	Pendleton	4-site average
1997-1999 percent of trial average						
Alpowa (Gaucho)	SW	104	114	102	103	106
Alpowa (no Gaucho)	SW	102	100	114	93	102
IDO377S	HW	109	109	105	107	108
Jefferson	HR	110	96	105	109	105
Penawawa	SW	108	97	100	108	103
Pomerelle	SW	117	104	95	105	105
Scarlet	HR	94	94	100	106	99
Wawawai	SW	102	87	91	101	95
Whitebird	SW	96	91	93	92	93
Winsome	HW	107	100	95	95	99
WPB936	HR	79	96	112	99	97
Yecora Rojo	HR	66	94	93	92	86

* All seed was treated with fungicide and Gaucho insecticide unless otherwise noted.
** SW=soft white, HW=hard white, HR=hard red

Table 8. 1999 spring barley yields across five locations in Oregon.

Variety or line*	Market class**	Hermiston***	La Grande***	Moro	Morrow County	Pendleton	Average	5-site % of average
				Yield (lb/acre; 10% moisture)				
Bancroft	2RM	3,796	1,989	3,093	1,176	3,093	2,629	86
Baronesse	2RF	5,416	2,388	3,495	1,592	3,495	3,277	108
BCD 12	2RF/M	5,581	3,243	3,259	1,118	3,259	3,292	108
BCD 22	2RF/M	4,926	3,161	3,455	1,266	3,455	3,253	107
BCD 47	2RF/M	4,158	3,718	2,994	1,336	2,994	—	—
Chinook	2RM	3,610	2,754	3,322	1,374	3,322	2,876	95
MT920073	2RF/M	3,684	2,772	3,583	1,452	3,583	3,015	99
Orca	2RF	2,994	3,281	3,071	1,314	3,071	2,746	90
Steptoe	6RF	3,290	1,650	3,641	1,421	3,641	2,729	90
Tango	6RF	3,425	1,770	3,617	1,341	3,617	2,754	91
Valier	2RF	4,346	2,318	3,284	1,525	3,284	2,951	97
WA9504-94	2RF	5,540	3,425	3,110	1,264	3,110	3,290	108
Xena	2RF	4,138	2,660	3,343	1,629	3,343	3,022	99
C-32	2RM	5,190.3	—	—	—	—	—	—
Galena	2RM	5,261.7	—	—	—	—	—	—
Idagold	2RF	6,217.3	—	—	—	—	—	—
Average		**4,473**	**2,702**	**3,328**	**1,370**	**3,328**	**3,040**	—
PLSD (5%)		**1,000**	**816**	**297**	**157**	**297**	**513**	—
PLSD (10%)		**831**	**676**	**246**	**130**	**246**	**426**	—
CV		**13**	**18**	**5**	**7**	**5**	**10**	—
P-value		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	—

* All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted.
** 2RM=2 row malt, 2RF=2 row feed, 6RF=6 row feed, F/M= line being considered as a malt type
*** Hermiston and La Grande trials were damaged by hail storms on June 24, 1999.

Table 9. 1997-99 spring barley yields across 5 locations in Oregon

Variety or line*	Market class	Hermiston	La Grande	Moro**	Morrow County**	Pendleton**	All sites average
1997		----------Yield (lbs/acre; 10 % moisture)----------					
Bancroft	2RM	2,618	6,633	5,242	1,643	3,921	4,011
Baronesse	2RF	2,985	5,801	6,496	3,372	4,177	4,566
Chinook	2RM	2,967	5,400	5,866	2,133	4,208	4,115
Orca	2RF	2,760	6,637	3,466	2,827	3,707	3,879
Steptoe	6RF	2,042	6,574	6,044	2,021	4,157	4,168
C-32	2RM	2,970	—	—	—	—	—
Galena	2RM	3,800	—	—	—	—	—
Gallatin	2RF	2,664	5,360	4,930	1,759	3,338	3,610
Idagold	2RF	2,992	—	—	—	—	—
1997 trial average		**2,505**	**6,349**	**4,943**	**1,853**	**3,700**	**3,870**
1998							
Bancroft	2RM	3,936	4,086	—	—	3,894	3,972
Baronesse	2RF	4,147	4,070	—	—	3,414	3,877
Chinook	2RM	3,873	3,299	—	—	3,773	3,648
Orca	2RF	3,071	3,557	—	—	4,320	3,650
Steptoe	6RF	3,349	3,903	—	—	3,946	3,732
C-32	2RM	3,609	—	—	—	—	—
Galena	2RM	3,536	—	—	—	—	—
Gallatin	2RF	3,866	3,978	—	—	3,511	3,785
Idagold	2RF	3,428	—	—	—	—	—
1998 trial average		**3,602**	**3,928**	**—**	**—**	**3,959**	**3,830**
1999							
Bancroft	2RM	3,796	1,989	3,093	1,176	2943	2599
Baronesse	2RF	5,416	2,388	3,495	1,592	3070	3192
Chinook	2RM	3,610	2,754	3,322	1,374	2817	2775
Orca	2RF	2,994	3,281	3,071	1,314	2801	2692
Steptoe	6RF	3,290	1,650	3,641	1,421	3068	2614
C-32	2RM	5,190	—	—	—	—	—
Galena	2RM	5,262	—	—	—	—	—
Gallatin	2RF	—	—	—	—	—	—
Idagold	2RF	6,217	—	—	—	—	—
1999 trial average		**4,473**	**2,702**	**3,328**	**1,370**	**3328**	**3040**

Table 9. 1997-99 spring barley yields across 5 locations in Oregon (continued).

Variety or line*	Market Class**	Hermiston	La Grande	Moro***	Morrow County***	Pendleton***	All sites average
1997-1999 average			----------Yield (lb/acre; 10% moisture)----------				
Bancroft	2RM	3,450	4,236	—	—	3,636	3,774
Baronesse	2RF	4,182	4,086	—	—	3,695	3,988
Chinook	2RM	3,483	3,818	—	—	3,768	3,690
Orca	2RF	2,942	4,492	—	—	3,699	3,711
Steptoe	6RF	2,894	4,042	—	—	3,915	3,617
C-32	2RM	3,923	—	—	—	—	—
Galena	2RM	4,199	—	—	—	—	—
Gallatin	2RF	—	—	—	—	—	—
Idagold	2RF	4,212	—	—	—	—	—
1997-1999		**3,527**	**4,326**	**2,757**	**1,074**	**3,662**	**3,069**
1996-1998 percent of trial average							
Bancroft	2RM	98	98	—	—	99	98
Baronesse	2RF	119	94	—	—	101	105
Chinook	2RM	99	88	—	—	103	97
Orca	2RF	83	104	—	—	101	96
Steptoe	6RF	82	93	—	—	107	94
C-32	2RM	111	—	—	—	—	—
Galena	2RM	119	—	—	—	—	—
Gallatin	2RF	—	—	—	—	—	—
Idagold	2RF	119	—	—	—	—	—

* All seed was treated with fungicide and Gaucho insecticide.

** 2RM=2 row malt, 2RF=2 row feed, 6RF=6 row feed, F/M= line being considered as a malt type

*** 1998 Pendleton, Moro, and Morrow counties spring barley trials had high variability, making variety comparisons meaningless.